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RESOURCE ALLOCATION AND DEFENSE PLANNING IN RETROSPECT AND PROS--ETC(U)
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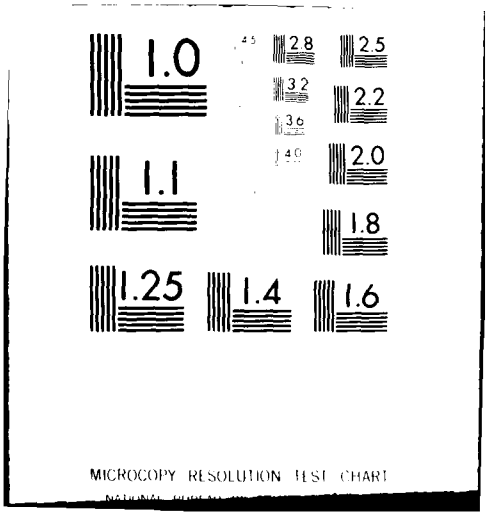
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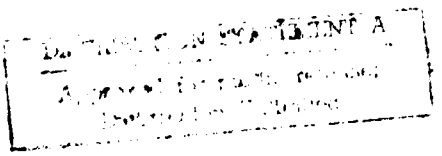
RESOURCE ALLOCATION AND DEFENSE PLANNING IN RETROSPECT AND PROSPECT

Charles Wolf, Jr.

June 1979



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Santa Monica, California 90406

RESOURCE ALLOCATION AND DEFENSE PLANNING IN RETROSPECT AND PROSPECT*

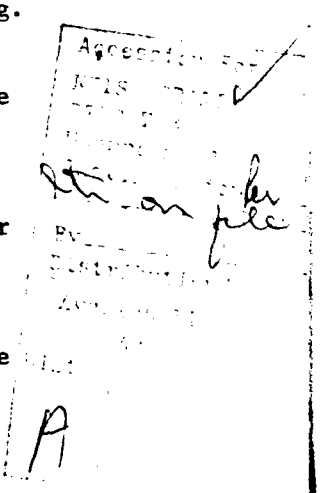
I. INTRODUCTION

The title of this paper is formidable, and probably pretentious, in scope. The first part of the topic, "Resource Allocation," embraces literally all of defense economics. The second part, "Defense Planning," if interpreted literally, covers strategic forces, doctrines, and targeting; general purpose forces and their employment; defense research, development and systems acquisition; command, control and communications, the effects of SALT II and other arms control agreements on all of the foregoing; and so forth.

Furthermore, the combination of "resource allocation" and "defense planning" implicitly covers other special policy issues, as well. For example, such issues as arms transfers, and the structure, scale, and role of overseas bases and deployments of U.S. forces, in NATO, Korea, and the Philippines, also come within the topic, because they involve the allocation of defense resources. Even an issue as remote as U.S. export control policies legitimately comes within the purview of resource allocation and defense planning. For example, U.S. exports of computer technology may affect Soviet capabilities, and hence influence U.S. defense planning and resource allocations.

Frankly, I don't know anyone who is qualified to address all of these issues adequately without drawing upon a substantial number of coauthors! Certainly, I am not qualified to do so.

What, then, should one do in facing such a formidable subject, under severe limitations of time and knowledge and with a reluctance to draw upon a dozen or more colleagues at Rand or elsewhere as coauthors?



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*Prepared for a conference on the economics of national security, jointly sponsored by the United States Air Force Academy and The Rand Corporation, August 15-18, 1979, Colorado Springs, Colorado. An earlier version of this paper was presented at the Pacific Conference on Operations Research, April 23-28, 1979, Seoul, Korea.

My response is to attempt only a very limited treatment of the topic.

The *retrospective* part of my remarks will review a landmark book in this field, *The Economics of Defense in the Nuclear Age*, written by my former Rand colleagues, Charles Hitch and Roland McKean (hereafter referred to as H-M), and published in 1960.* In a symposium, such as this, devoted to taking stock of the field of national security economics, it is appropriate to cast a backward look, at where the field has been, before trying to look ahead to where it is going. H-M is probably the most comprehensive work on resource allocation and defense planning published in the past two decades. The question I will address in my retrospective remarks is: How does H-M look nearly twenty years after publication? What are its significant omissions and commissions?

The *prospective* part of my remarks will then try to identify and comment on a few major current and impending issues of resource allocation and defense planning.

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*Charles Hitch and Roland McKean, *The Economics of Defense in the Nuclear Age*, Harvard University Press, Cambridge, Massachusetts, 1960.

II. IN RETROSPECT

Let me begin by refreshing your recollection of the H-M book. It is divided into three sections. Part I, "Resources Available for Defense," addresses the relationship between defense and the domestic economy. Part II, "Efficiency in Using Defense Resources," deals with allocative options within the military sector, and the competing and complementary relations among operations decisions, procurement and force composition decisions, and research and development decisions. Part III, "Special Problems and Applications," covers such specialized topics as the economics of military alliances, logistics, economic warfare, and R&D decisionmaking.

In my judgment, H-M stands up remarkably well to rereading in 1979. I know I would be gratified if something I have written, or have yet to write, could meet nearly as effectively as H-M the test of rereading twenty years later!

Nevertheless, there are a number of interesting omissions and commissions in H-M that, in retrospect, appear worthy of comment. Consider the following examples:

1. In discussing the relationship between inflation and defense, H-M stresses the effect of defense spending on inflation. The authors don't give much attention to the *effect of inflation on defense spending*. From the vantage point of 1979, this relationship is at least as important as the reverse one. The deep-seated and persistent inflationary characteristics in the American economy at present have major consequences for defense resource allocation and planning. For example, the difficult problem of estimating life cycle costs of new weapons systems is made still more difficult because of inflation and its possibly differential impact on various cost components--for example, capital and manpower costs.

Consider, also, the political commitment made by the U.S. to our NATO allies to raise the real value of defense spending on NATO-related forces. The issue of a proper deflator for calculating real as against nominal defense outlays has now become relevant to

planning and policy. It was largely irrelevant in the relatively stable economic environment in which H-M was written.

2. The index to H-M has no reference to *energy* or *oil*. However, the chapter dealing with "economic warfare" includes this prescient reference:

> "Control over Middle Eastern oil by any single power or bloc would be a comparatively potent weapon because it could upset the Middle East and European economies sharply, particularly during an initial period before adjustments could be made."*

Notably, the quotation omits the U.S. However, with U.S. oil imports currently amounting to 50 percent of national consumption, the U.S. has also become highly vulnerable to a protracted interruption of Middle Eastern oil supply, although less vulnerable than our European and Asian allies. One major consequence of this sharp economic change is the importance for national security of the proposed Strategic Petroleum Reserve. Originally proposed at a level of $25 billion, the SPR has become an important issue and resource claimant in U.S. defense and foreign policy planning in the 1980s, as it was not in the 1960s.

3. The index to H-M contains no reference to such major issues of *international finance* as those related to the "overhang" of roughly 500 billion Eurodollars in international exchange markets. One result of this overhang is a high degree of instability in foreign exchange rates under the present flexible rate system. The fluctuating value of the dollar creates new problems for national security economics: for example, forecasting the relative costs of systems produced at home or abroad--or coproduced abroad; and evaluating the costs of forward-based forces in Europe, Korea, and the Western Pacific, compared with forces in the U.S.

These were not important issues at the time H-M was written. They are serious concerns now, and likely to become more so in the years ahead.

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*Op. cit., p. 303.

4. H-M does not address the subject of *nuclear proliferation*, perhaps one of its more surprising omissions.

Expansion of nuclear reactors in the past two decades--probably a considerably greater expansion than strictly economic calculations would have warranted--has created serious issues for defense planning in the 1980s that were not foreseen in the 1960s. On the one hand, these issues relate to the entire fuel cycle: uranium supply; enrichment and reprocessing technology and facilities; waste management; and the breeder reactor. How these stages of the cycle are managed or avoided will affect the supply of weapons-grade nuclear materials in various countries and regions. On the other hand, proliferation also depends on the incentives that exist, or may be perceived to exist, for such countries as Korea and Taiwan to acquire nuclear weapons in order to strengthen deterrent capabilities they may feel have been weakened by changes in U.S. foreign policy or in the military balance.

5. At a more microeconomic level, one finds surprising the absence in H-M of any detailed discussion of policies and costs relating to *military manpower*. Since establishment of a volunteer military force in 1973, a close linkage has been created between civil labor markets and the market for military manpower. The resulting impact on the budgetary costs of defense, and the optimal structuring and operation of forces as between capital-intensive and labor-intensive components, have become important issues of defense economics in the 1980s, which were not of concern in the 1960s.

6. In some respects, H-M reflects a view of the nature of war, of *deterrence*, and of defense economics that seems, in retrospect, rather oversimplified. For example, H-M make the following remarkable observation:

> "In our view the problem of combining limited quantities of missiles, crews, bases, and maintenance facilities to 'produce' a strategic air force that will maximize deterrence of enemy attack is just as much a problem of economics

> (although in some respects a harder one) as the problem of combining limited quantities of coke, iron, or scrap, blast furnaces, and mill facilities to produce steel in such a way as to maximize profits."*

From the vantage point of 1979, most of us, I believe, would consider this statement to be inadequate and misleading, for it ignores several considerations which seriously impair the analogy: the vastly greater difficulty of specifying the "deterrence" objective than the "profit" objective; the fact that "deterrence" depends on the perceptions and the actions of Soviet decisionmakers, as well as on U.S. actions; and the potentially important interactions between U.S. decisions about developing, procuring and deploying forces, and those of the Soviet Union.

Notwithstanding these few critical comments, I repeat my earlier general assessment: *The Economics of Defense in the Nuclear Age* remains, twenty years after it was written, a valuable survey of defense economics. As I mentioned earlier, I think any of us would be happy if work we have done passes the test of time as well as does H-M!

H-M makes a particular point which is unusually prescient with respect to the economic issues related to defense planning in the future. Written at a time when nuclear weapons were often accorded an exaggerated, and sometimes exclusive, role in defense analysis, H-M reminds the reader of the importance of "economic strength as a deterrent of lesser aggression."** The importance they ascribe to *mobilization potential*--the ability to boost defense spending, and undertake rapid economic and military mobilization efforts--as a deterrent to conflicts short of all-out nuclear attack, is unusually discerning. I believe this issue of mobilization potential will acquire increased interest among the matters that defense planners are concerned with in the years ahead.

In recalling the importance of mobilization capabilities in the past, I think H-M envisaged the future.

Op. cit., p. 2.

**Op. cit.*, p. 317.

III. IN PROSPECT

What issues of defense economics and defense planning in the U.S. are likely to assume greater importance in the years ahead? I have already suggested some answers in commenting on the H-M book. In addressing the question directly, one principal theme underlies the points I will make: defense economics will be significantly influenced by a number of broad developments in the national as well as international economy. The extent of this influence will be even greater in the future than in the recent past.

DEFENSE RESOURCE ALLOCATION AND THE U.S. ECONOMY

At the macroeconomic level, a number of important changes are under way in the relationships between defense resource allocation and the economy as a whole.

For example, over the past twenty years the proportion of U.S. resources devoted to defense has declined sharply. Defense expenditures declined from 12 percent of national income in 1957 to 11 percent in 1967, 6 percent in 1977, and less than 5 percent in the proposed 1980 budget. Defense planning will face tight resource constraints in the future. Defense decisionmaking will be more visible, more subject to scrutiny, review, "second-guessing," and criticism than has been customary. Consequently, careful analysis of alternatives, tradeoffs, and costs and effectiveness of competing ways of allocating defense resources, will be in still greater demand in the future than in the past.

In the U.S., and perhaps also in Western Europe, we have entered a period in which taxpayers and their representatives are displaying a growing resistance to expenditures by the public sector. California's Proposition 13, and its repercussions, are indicative. In part, this resistance is due to a general disenchantment with programs undertaken by government, perhaps even more in non-defense than in defense sectors. The result is to place additional constraints on resource availability in the public sector.

How will these fiscal limitations affect resource availabilities for defense purposes? The question is both important and difficult to answer. In the President's proposed budget for FY 1980, defense is the only major federal government program for which an increase in real expenditures is planned. Expenditures on social programs, energy, transportation and housing are, generally, scheduled for constant or reduced real outlays.

Is this small expansion in defense outlays likely to be enduring or transitory?

There are a number of reasons why it may be transitory: for example, the short-run political maneuvering which perhaps links increased defense spending to lining up Congressional support for ratification of the SALT II agreement; the possibly temporary pledge to our NATO allies to raise NATO-related expenditures by the U.S. to match the planned increases by other NATO members; and the political pressures in some important and influential circles to curtail defense outlays in order to provide or expand social programs, such as health insurance.

On the other hand, there are reasons why the increases in defense spending may persist. For example, the increased resources allocated to the defense sector are, in part, a consequence of the Soviet build-up in both strategic and general purpose forces, and there is as yet no evidence that this will let up. Also, the U.S. pledge to increase NATO-related expenditures may be renewed. Moreover, it can be argued that the American taxpayer's resistance to public expenditures, as reflected in Proposition 13 and other similar measures on the American legislative scene, may be directed more toward non-defense than defense programs. Non-defense programs undertaken by the public sector often entail activities in which the private sector might plausibly assume a greater role (such as in housing, transportation, energy, and even in education), if public sector programs were reduced. This argument does not apply in the defense sector, the classic case of a "pure" public good which the market for "private" goods and services cannot replace. Consequently, political and economic pressure to curtail government spending may impinge more on non-defense than defense programs.

Thus, there are forces pushing in opposite directions on the issues of future defense vs. non-defense expenditures. I wouldn't make a guess now as to which forces will be stronger. Soviet behavior and Soviet defense programs are likely to have a major influence on the outcome.

Another macroeconomic allocation issue arises from changes that have occurred in recent years in the structure of American industry. These changes may lead to reduced price competition in the U.S. economy and U.S. industry, including defense industry. The changes result from the greater market power of both labor and business, leading to stronger cost-push inflationary forces, which are reinforced by the cost impact of regulatory and environmental constraints. Defense costs may therefore rise at the same time as defense budgetary appropriations are under severe constraints.

On the other hand, an optimist might argue that a leaner and more efficient defense industrial base may result. Tighter budgets and rising costs may create pressures toward economizing, streamlining, and weeding out inefficient firms. The result may be increased efficiency among the surviving firms.

This scenario is certainly possible, but I think unlikely.

More likely, over the next few years, is a scenario in which the rate of innovation and productivity increase in American industry continues to be low. In recent years, productivity increases have fallen from approximately three percent per year to about one percent. The result may be a *lower price elasticity of supply of defense resources in the future than in the past.* Resource mobilization in the American economy may become increasingly, perhaps excessively, costly. Hence, mobilization may become politically less feasible in the future. The threshold of provocative necessary to trigger mobilization may accordingly rise.

Defense planners, to the extent that they are concerned with planning for possible "surge" expansion of the defense sector, will have to take these new structural developments prominently into account.

THE DEFENSE SECTOR AND THE INTERNATIONAL ECONOMY

I will address only two aspects of the changing relationships between the defense sector and the international economy.

As noted earlier, the U.S. is now more vulnerable to an oil embargo, or the threat of embargo, than in the past. It is a deplorable commentary on U.S. policy making that the prospect for reducing this dependence over the next three to five years looks dim.

Two important implications follow for defense planning. As suggested earlier, the Strategic Petroleum Reserve should be viewed as an important aspect of defense planning and defense economics. Whether the reserve covers import demand for 120 days, as was originally intended, or only 60 days, will seriously affect resource mobilization problems in the event of an emergency.* And energy policy, in general, will be an important aspect of defense planning and policy in the future.

Future defense planning will also be affected by the huge foreign holdings of dollars. At the present time, foreign dollar holdings exceed the total U.S. money supply by about 20 percent! Small changes in the confidence and expectations of these asset holders can have dramatic effects on the exchange value of the dollar, as illustrated by the sharp fall in the dollar's international value in 1978, and its surprising rise between November 1978 and the Spring of 1979. The costs of forward deployed military forces can be seriously affected by these currency changes.

I expect that this source of enhanced uncertainty will become increasingly important to defense planners.

TECHNOLOGICAL DEVELOPMENTS AND DEFENSE PLANNING

Recent and impending developments in information processing, guidance and sensor technology will have dramatic implications for defense planning and resource allocation.

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*In fact, the existing petroleum reserve is less than the lower level.

On the one hand, the new technology makes possible more complete and accurate command and control of the battlefield, as well as more accurate targeting and delivery of ordnance. On the other hand, the rising budgetary costs of manpower, resulting from the all-volunteer force and the resulting link between military compensation and the civil sector labor market, creates a greater incentive for defense planners to save on labor costs in force posture and system development decisions. As a result, defense analyses in the future will have to give more explicit attention to capital-labor substitutions in the development of systems, and in the structuring and operation of forces.

IV. CONCLUSIONS

The foregoing list is not exhaustive, but it indicates some of the major issues likely to affect defense economics in the future: increasing competition for public sector resources; possibly increasing real costs in defense industry in the midst of an inflation-prone economy; the growing relevance of energy policy in defense planning; the increased importance of international financial developments and exchange rate uncertainty in the planning and deployment of forward based forces; and the new opportunities, provided by technological developments, for capital-labor substitutions in the planning of defense forces.

I will conclude with one observation relating to the *methodology* of defense policy and planning studies.

In defense planning studies in the future, we will have to give greater attention to *implementation analysis* than we have in the past. Typically, planning studies have proceeded by comparing the costs and effectiveness of alternative programs, employing a more or less formal model of the problem under consideration. A preferred program is then selected by applying the usual sort of criterion to the results of the model: for example, maximizing effectiveness for a specified budget, or minimizing costs for specified effectiveness. Sometimes, indeed more and more frequently, a dominant choice doesn't emerge because there are numerous dimensions for calculating costs and effectiveness: for example, short-run and long-run costs without agreement on a discount rate; initial and survivable capabilities; surge and sustainable capabilities; political impacts on allies or adversaries; etc.

Moreover, the various dimensions are likely to have different degrees of uncertainty associated with them, as well as different weights attached to them by different groups outside as well as inside the policy community. Under these circumstances, policy analytic studies should, and sometimes do, display separately the various dimensions of cost and effectiveness, scoring the competing alternatives accordingly, and leaving choice to the decisionmaker or decisionmaking process.

Even the most sophisticated analyses usually ignore or give meager attention to implementation issues. Defense planning studies rarely raise, and almost never answer, such questions as *who* would have to do *what*, *when*, and with what possible and likely resistances, modifications, and compromises, if alternative A were chosen, or B, or C? It is therefore implicitly assumed that the costs and benefits as modeled in the analysis, won't be altered when a particular choice is implemented.

When this assumption is made explicit, it will be readily acknowledged to be unwarranted, as is suggested by a vast range of cases: for example, the awkward history of the development of the FB-111, the substantial overrunning of initial estimates of costs and schedules for the C-5, nuclear aircraft carriers, the Airborne Training and Control System, and the main battle tank; and innumerable other instances of "goldplating" in the development of new weapons systems. Can we do a better job in the future in systematically including in defense studies an analysis of implementation risks and prospects of how programs are likely to go askew after a decision is made to go ahead?

If we are to answer affirmatively, the so-called "missing chapter"--dealing systematically with implementation prospects--must become a standard part of defense policy studies.

In recent years, discussion of implementation issues had increased substantially. It has been concentrated in the new public policy journals, several recent books and case studies, and the curricula of graduate schools of policy analysis. Most of this discussion has emphasized the typically large gap between programs as designed and as executed, the lack of appropriate methods for anticipating these gaps and taking them into account in doing policy studies, and consequently the marked shortcomings of all defense planning analysis in failing to address implementation explicitly and systematically.

I have tried to deal with this set of issues elsewhere.* In any event it would take me too far afield to try to summarize the discussion

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*Charles Wolf, Jr., "A Theory of 'Non-Market Failure': Framework for Implementation Analysis," *The Journal of Law and Economics*, April 1979.

here. However, in conclusion, I predict that resource allocation and defense planning studies that are done in the future will and should devote more careful, systematic, and thorough attention to implementation considerations than they have in the past.